OCEAN GALES AND STORMS, NOVEMBER, 1931—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Highest force of wind and direction	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH PACIFIC OCEAN			° ′	° ′				*Inches*					
Hakushika Maru, Jap. S. S.	Miike	Port Townsend.	49 07 N	154 10 E	Oct. 30	Mdt., 3	Nov. 4	29.33	S	S, 9	S	S, 9	Steady.
Emp. of Asia, Can. S. S.	Vancouver	Yokohama	45 35 N	158 11 E	Nov. 1	2 a., 2	Nov. 2	29.50	SW	W, 8	W	WNW, 10	SW-W-WNW.
Chief Capilano, Br. S. S.	do	do	48 15 N	166 45 E	Nov. 2	4 p., 2	Nov. 3	29.22	SW	WSW, 10	NW	W, 11	WSW-W.
Illinois, Am. S. S.	Portland	do	47 03 N	164 10 E	do	1 p., 2	Nov. 4	29.32	S	W, 11	N	W, 11	WSW-W.
Golden Wall, Am. S. S.	Hong Kong	San Francisco	46 09 N	172 30 W	do	1 p., 2	do	29.60	W	WSW, —	WNW	WSW, 9	WSW-W.
Tyndareus, Br. S. S.	Yokohama	Victoria	49 00 N	177 40 W	do	4 p., 4	do	29.06	WSW	WNW, 9	WNW	W, 10	WNW-NW.
Melville Dollar, Am. S. S.	Cebu, P. I.	Los Angeles	39 27 N	140 01 W	do	2 a., 3	do	29.41	NE	N, 10	W	NNE, 11	2 pts.
Satanta, Br. S. S.	Yokohama	San Pedro	44 43 N	178 18 W	do	8 a., 3	Nov. 5	29.37	WNW	W, 10	NW	W, 10	W-WNW.
Soyo Maru, Jap. M. S.	do	San Francisco	47 20 N	167 38 W	do	3 p., 3	do	29.11	W	WSW, 9	W	WSW, 9	WSW-SW.
Alaska, Am. S. S.	Seattle	Seward	Resurrection Bay, Alaska		Nov. 3	3 p., 4	Nov. 4	29.62	S	S, 6		S, 10	Variable.
Bellingham, Am. S. S.	Dairen	San Francisco	47 45 N	177 45 W	do	8 a., 3	Nov. 5	29.04	W	W, 8	NW	W, 9	W-WNW-W.
Ohioan, Am. S. S.	New York	Los Angeles	15 20 N	93 25 W	Nov. 4	4 p., 4	Nov. 4	29.84	NW	NW, 5	NW	N, 9	
Pres. Jefferson, Am. S. S.	Victoria	Yokohama	52 31 N	158 48 W	Nov. 3	4 p., 4	Nov. 7	28.70	SSE	WSW, 5	NW	NW, 8	WSW-W.
Lebec, Am. S. S.	Portland	San Pedro	45 38 N	124 17 W	Nov. 6	—	Nov. 6	29.94	S	S, 7	SSW	S, 8	Steady.
Helen Whittier, Am. S. S.	Balboa	San Francisco	15 00 N	94 10 W	Nov. 8	5 p., 8	Nov. 9	29.87	NNW	NNW, 6	NNW	NNW, 10	Do.
Stuart Dollar, Am. S. S.	Philippines	Los Angeles	15 15 N	128 00 E	Nov. 9	5 a., 9	do	29.68	NNE	E, 11	S	E, 11	ENE-E.
Hayo Maru, Jap. S. S.	Muroran	William Head	45 06 N	161 43 E	Nov. 10	11 p., 12	Nov. 13	28.55	S	NNW, 10	SW	WNW, 11	
Pres. Cleveland, Am. S. S.	Yokohama	Seattle	48 09 N	173 23 E	do	6 p., 12	Nov. 14	29.15	SE	SE, 9	S	SSE, 9	SE-S-WSW.
Tamaha, Br. S. S.	Hong Kong	San Pedro	22 00 N	116 14 E	Nov. 11	6 a., 11	Nov. 11	29.52	ENE	NNE, 10	SE	NE, 11	NNE-NE.
Melmay, Br. S. S.	Portland	Hankow	34 51 N	154 47 E	do	2 p., 11	Nov. 12	29.73	SSW	NW, 9	NW	NW, 9	SW-NW.
Iowa, Am. S. S.	Japan	San Francisco	41 48 N	179 55 W	do	Noon, 12	do	29.63	S	SE, 7	SE	S, 9	S-SE.
Meigs, Am. S. S.	Manila	do	38 13 N	135 11 W	Nov. 14	6 a., 14	Nov. 14	29.93	NW	NW, 8	NNW	NW, 8	Steady.
Golden River, Am. S. S.	Hong Kong	do	39 13 N	153 06 E	Nov. 17	1 p., 17	Nov. 17	29.59	W	NE, 9	NNE	NE, 9	W-NE.
Akagisan Maru, Jap. M. S.	Yokohama	do	45 57 N	172 23 W	Nov. 18	6 a., 19	Nov. 20	28.37	NE	W, —	SW	WSW, 9	ENE-W-WSW.
Lebec, Am. S. S.	San Pedro	Seattle	40 40 N	124 38 W	Nov. 22	2 p., 22	Nov. 23	29.99	NNW	N, 7	N	N, 8	Steady.
Michigan, Am. S. S.	Tabaco, P. I.	San Francisco	26 00 N	137 20 E	do	8 p., 23	Nov. 24	29.31	ESE	S, 10	NW	S, 10	S-SW.
Stuart Dollar, Am. S. S.	Philippines	Los Angeles	38 30 N	178 30 W	Nov. 23	4 p., 23	do	28.88	SE	SE, 4	NW	NNW, 12	
Defiance, Am. M. S.	Shanghai	San Pedro	31 26 N	133 00 E	do	Mdt., 23	do	29.59	NE	ENE, 11	N	ENE, 11	NE-ENE.
San Luis Maru, Jap. M. S.	Kudamatsu	Los Angeles	39 50 N	164 12 W	do	6 p., 23	do	29.11	SSE	SSE, 9	W	SSE, 9	SSE-S.
Golden River, Am. S. S.	Hong Kong	San Francisco	46 35 N	170 19 W	do	2 p., 25	Nov. 26	29.13	N	S, 11	SW	SSE, 12	SSE-S.
Emp. of Russia, Can. S. S.	Vancouver	Yokohama	52 30 N	157 00 W	Nov. 24	7 p., 24	Nov. 25	29.71	SSE	SE, 9	SW	SE, 9	SE-S.
Do	do	do	52 00 N	168 00 W	Nov. 25	8 a., 25	Nov. 27	28.76	SW	S, 11	SW	S, 11	
Reiyo Maru, Jap. S. S.	Muroran	Juan de Fuca	49 03 N	170 35 W	do	6 p., 25	Nov. 26	28.62	SE	S, 10	SW	SSW, 11	6 pts.
Oregon, Am. S. S.	Otaru	San Francisco	50 25 N	171 30 W	do	8 a., 25	do	28.44	SSE	SE, 11	W	S, 12	SE-S.
Hakubasan Maru, Jap. M. S.	Yokohama	do	45 10 N	175 33 W	do	5 a., 25	Nov. 27	28.63	SSW	SSW, 10	W	SSW, 10	1 pt.
Stuart Dollar, Am. S. S.	Philippines	Los Angeles	38 18 N	152 00 W	Nov. 29	9 p., 29	Nov. 30	30.05	N	N, 8	NNE	N, 10	N-NNE.
Defiance, Am. M. S.	Shanghai	San Pedro	41 24 N	163 30 E	do	3 a., 30	do	29.09	ESE	—, 8	NNW	NW, 11	SSW-W.
Golden Sun, Am. S. S.	Dairen	San Francisco	38 24 N	177 18 W	Nov. 30	Mdt., 30	do	29.77	S	NW, 8	NW	NW, 8	W-NW.
SOUTH ATLANTIC OCEAN													
Maria De Larrinaga, Br. S. S.	England	Nacochea, Argentina.	Nacochea		Nov. 4	1 a., 4	Nov. 4	29.51	SW	SW, —	NNW	SW, 10	SW-W.
Persier, Belg. S. S.	Buenos Aires	Santos	25 54 S	48 38 W	Nov. 7	4 a., 8	Nov. 8	29.43	NE	NNE, 9	NW	NNE, 9	NNE-NW.
Brasilien, Dan. S. S.	Hull	Buenos Aires	31 20 S	48 40 W	Nov. 15	4 a., 16	Nov. 17	29.24	NE	WSW, 10	SW	WSW, 10	NW-W-S.

NORTH PACIFIC OCEAN

By WILLIS E. HURD

Atmospheric pressure, November, 1931.—The average center of the Aleutian LOW in November was far to the westward of its October position, and lay over Bering Sea (St. Paul 29.50 inches, and Dutch Harbor 29.55 inches). At both these stations the pressure averages were below the normal for the month. Winter conditions of pressure, with some extremely great and rapid fluctuations in the barometer from day to day, were common to the whole Aleutian region. Instances of this great pressure variability are shown in the p. m. barometer readings at Dutch Harbor from the 23d to the 27th, which are as follows: 23d, 29.90 inches; 24th, 28.60; 25th, 29.68; 26th, 28.86; 27th, 29.80. Pressures above normal were found along the American coast from Kodiak eastward and southward to Tatoosh Island.

Fairly stable high pressure, with the average crest of the anticyclone over the eastern part of the ocean, prevailed in middle latitudes, while a continuing belt of moderately high pressure extended westward along lower middle latitudes to near the Asiatic coast. Here it expanded to include Japanese waters and the eastern seas of China. As usual to the season, in the Japanese region the anticyclone was considerably broken by the intrusion of frequent LOWS.

The following table gives barometric data for several island and coast stations in west longitudes, including Point Barrow on the Arctic Ocean.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean and adjacent waters, November, 1931, at selected stations*

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow [1] [2]	30.00	+0.01	30.92	13th	29.20	28th.
Dutch Harbor [1]	29.55	−0.04	30.50	12th	28.60	3d.
St. Paul [1] [2]	29.50	−0.09	30.40	12th	28.40	3d.
Kodiak [1]	29.68	+0.12	30.36	24th	29.02	5th.
Midway Island [1]	30.05	−0.03	30.24	29th	29.70	17th.
Honolulu [3]	29.99	−0.03	30.12	4th	29.85	26th.
Juneau [3]	29.95	+0.19	30.59	25th	29.20	1st.
Tatoosh Island [3] [4]	30.02	+0.05	30.44	21st	29.28	16th.
San Francisco [3] [4]	30.05	−0.04	30.38	19th	29.67	14th.
San Diego [3] [4]	30.00	−0.02	30.20	19th	29.60	21st.

[1] P. m. observations in averages: a. m. and p. m. in extremes.
[2] For 29 days.
[3] A. m. and p. m. observations.
[4] Corrected to 24-hour mean.

Cyclones and storminess.—November, 1931, may be called a stormy month on the North Pacific. Moderate to intense progressive cyclones, as well as oscillating storms of the Aleutian LOW type, swept upper and middle

latitudes. Typhoons and strong monsoons were felt in the Far East. Locally intensified trades, rising in force to that of a fresh gale, were reported on the 9th to 11th east of the Hawaiian Islands, and on several days Tehuantepecers roughened the weather off the Mexican south coast. But stormiest of all the regions was that lying approximately between latitudes 35° and 53° N., and longitudes 165° W. and 160° E. This region was traversed by most of the principal cyclones of the month.

The earliest northern cyclone of November, coming out of Siberia on the 1st, passed eastward over the Aleutians and entered the American mainland on the 6th. It was attended by fresh to whole westerly gales over an extensive area, involving the main trans-Pacific steamship routes south of the Aleutians, with the highest wind, force 11, on the 2d.

During the 9th to 12th another Siberian cyclone, after crossing the lower Kurils, sped northeastward and entered the Aleutian area. Its effects were experienced by shipping most severely on the 12th, during which day gales of varying forces up to 11 were reported along the upper route between 160° and 175° E.

About the 22d or 23d a storm development, secondary to a disturbance then over the Aleutians, appeared to the northeastward of Midway Island. At first it had a northwesterly trend about the HIGH then overlying the eastern part of the ocean, but by the 24th it was moving nearly north toward the Bering Sea, which it entered on the 26th. During most of its course it was a deep and violent cyclone. The heavy gales associated with it began on the 23d, when the American steamship *Stuart Dollar* encountered a northwesterly hurricane in 38° 30′ N., 178° 30′ W., barometer down to 28.88 inches. On the 25th several vessels experienced wind forces of 11 to 12, among them the American steamship *Oregon*, which encountered a southeast hurricane, with barometer down to 28.44 inches, in 50° 25′ N., 171° 30′ W. The cyclone continued northward with diminishing energy and by the 28th lay over northern Alaska and the adjacent Arctic Ocean.

During the 29th, in about 42° N., 163° E., the American motor ship *Defiance* encountered a northwest gale of force 11 in connection with a moderately deep cyclone, the earlier and subsequent movements of which are as yet little known.

Other gales of forces 8 to 10, not associated with the cyclones already mentioned, occurred at various times over the northern Pacific. They were for the most part connected with the fluctuating activities of the semipermanent Aleutian LOW. On the American coast fresh gales occurred on a few days, due to the proximity of depressions over the western extremity of the continent. The most important of these winds are mentioned in the tabular report of gales and storms.

One further extratropical cyclone needs to be mentioned. It gathered on the 1st of the month near 32° N., 147° W., in the midst of the North Pacific anticyclone. It had a slow northeast progression, but by the 3d, then central near 37° N., 137° W., it had penetrated the high-pressure area and joined the lower extension of the Aleutian cyclone to the northward. Thereafter it quickly lost identity and force, and only a very shallow depression remained of it off the California coast on the 4th. The cyclone attained local violence on the 3d, as may be gathered by the report of the American steamer *Melville Dollar*. which experienced a northerly gale of force 11, barometer down to 29.41 inches, while crossing the LOW near 39° N., 140° W.

Typhoons.—Three November typhoons appear to have formed in the Far East. The first formed about midway between Guam and the Philippines on the 3d or 4th. It crossed central Luzon on the 7th and went westward into the China Sea. We have no present information as to its intensity.

The second typhoon probably formed on the 6th or 7th in much the same locality as had its predecessor. It went northwestward over Luzon and seems to have entered the China coast not far from Hong Kong on the 11th. Reports from two vessels indicate considerable intensity both east and west of the Philippines. On the 9th the American steamer *Stuart Dollar* experienced an east gale of force 11, lowest barometer 29.68, in 15° N., 128° E., and on the 11th the British tanker *Tamaha* encountered this storm as a northeasterly gale of similar force, lowest barometer 29.52, some 130 miles east of Hong Kong.

The third typhoon originated a little west of Guam on the 17th. After a westward movement for two or three days, it turned north, then went northeastward between the Ogasawara Islands and Japan, and disappeared at sea on the 24th near 40° N., 155° E. The American motorship *Defiance* experienced this cyclone as a gale of force 11 on the 23d, in 31° 26′ N., 133° 00′ E.

Northers.—Northers were reported in the Gulf of Tehuantepec from the 1st to the 8th, all of force 7, except on the 4th, when the gale rose to force 9, and on the 8th, when a force of 10 was encountered.

Winds at Honolulu.—The prevailing wind direction at Honolulu was from the east, with a maximum velocity of 24 miles from the east on the 8th.

Fog.—Only three or four days with fog were reported for all that part of the ocean west of 160° W. On the upper and middle routes between 130° and 160° W., scattered fog occurred on nine days, principally between the 19th and the 29th. There was much lessening of fog on the American coast as compared with October; but taking that part of the coast between Capes Mendocino and Conception as a whole, fog occurred on the first eight days of November and on the 20th. In the Gulf of Tehuantepec it was reported on the 16th and 21st near boundary lines of blue and green water.

TYPHOONS OF THE FAR EAST DURING SEPTEMBER AND OCTOBER, 1931

[Abstract of reports furnished by the Rev. MIGUEL SELGA, S. J., director, Weather Bureau, Manila, P. I.]

The manuscripts descriptive of the September and October typhoons in the Asiatic section of the North Pacific Ocean, kindly furnished by the Rev. Miguel Selga, S. J., director of the Philippine Weather Bureau, were received too late for inclusion in the September and October issues of the MONTHLY WEATHER REVIEW. Inasmuch as the regular North Pacific weather summaries have already given brief, though necessarily incomplete, mention of the several typhoons of those months, the restrictions of space in the current issue allow only of a brief résumé of the more important details that may be drawn from the articles in hand.

Typhoons of September.—Three typhoons of low latitudes were reported. The first, a very narrow but violent storm of September 1–4, appeared off the southeast China coast in the Taiwan Channel. The second, that of September 9–13, crossed the Eastern and Japan Seas, and disappeared north of Japan. It acquired greatest intensity and progressive velocity with passage of the Chosen (Korea) Strait. The third, that of September